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JC600 U.S. PTO 12/21/99

UTILITY PATENT APPLICATION TRANSMITTAL

(Only for new nonprovisional applications under 37 C.F.R. § 1.53(b))

Attorney Docket No.	1915-00100
First Inventor or Application Identifier	Sergio Luca Zini
Title	Device for Use in an Audio Signal Processing System
Express Mail Label No.	EL384214916US

JC678 U.S. PTO 09/470193 12/21/99

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

ADDRESS TO: Assistant Commissioner for Patents, Box Patent Application, Washington, DC 20231

1. [✔] * Fee Transmittal Form *(e.g., PTO/SB/17)* *(Submit an original and a duplicate for fee processing)*
2. [✔] Specification [Total Pages 24] *(preferred arrangement set forth below)*
   - Descriptive title of the Invention
   - Cross References to Related Applications
   - Statement Regarding Fed sponsored R & D
   - Reference to Microfiche Appendix
   - Background of the Invention
   - Brief Summary of the Invention
   - Brief Description of the Drawings *(if filed)*
   - Detailed Description
   - Claim(s)
   - Abstract of the Disclosure
3. [✔] Drawing(s) *(35 U.S.C. 113)* [Total Sheets 4]
4. Oath or Declaration [Total Pages 2]
   - a. [✔] Newly executed (original or copy)
   - b. [ ] Copy from a prior application (37 C.F.R. § 1.63(d)) *(for continuation/divisional with Box 16 completed)*
     - i. [ ] DELETION OF INVENTOR(S) Signed statement attached deleting inventor(s) named in the prior application, see 37 C.F.R. §§ 1.63(d)(2) and 1.33(b).

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5. [ ] Microfiche Computer Program *(Appendix)*
6. Nucleotide and/or Amino Acid Sequence Submission *(if applicable, all necessary)*
   - a. [ ] Computer Readable Copy
   - b. [ ] Paper Copy (identical to computer copy)
   - c. [ ] Statement verifying identity of above copies

ACCOMPANYING APPLICATION PARTS

7. [ ] Assignment Papers (cover sheet & document(s))
8. [ ] 37 C.F.R.§3.73(b) Statement *(when there is an assignee)* [ ] Power of Attorney
9. [ ] English Translation Document *(if applicable)*
10. [ ] Information Disclosure Statement (IDS)/PTO-1449 [ ] Copies of IDS Citations
11. [ ] Preliminary Amendment
12. [✔] Return Receipt Postcard (MPEP 503) *(Should be specifically itemized)*
13. [✔] * Small Entity Statement(s) *(PTO/SB/09-12)* [ ] Statement filed in prior application, Status still proper and desired
14. [ ] Certified Copy of Priority Document(s) *(if foreign priority is claimed)*
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17. CORRESPONDENCE ADDRESS

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Applicant or Patentee: ZINI Sergio Luca and RUGGERI Ruggero Attorney's
Serial or Patent No.: Docket No.: 1915-00108
Filed:
For: "DEVICE FOR USE IN AN AUDIO SIGNAL PROCESSING SYSTEM"

VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY
STATUS (37 CFR 1.9(f) and 1.27(b))-INDEPENDENT INVENTOR

As a below named inventor, I hereby declare that I qualify as an independent inven
as defined in 37 CFR 1.9(c) for purposes of paying reduced fees under section 41(
and (b) of Title 35, United States Code, to the Patent and Trademark Office with rega
to the invention entitled "Device for use in an audio signal processing system" described

[X] the specification filed herewith
[ ] application serial no. , filed .
[ ] patent no. , issued .

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the time of paying, the earliest of the issue fee or any maintentance fee due after
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I hereby declare that all statements made herein of my own knowledge are true and t
all statements made on information and belief are believed to be true; and further t
these statements were made with the knowledge that willful false statements and the l
so made are punishable by fine or imprisonment, or both, under section 1001 of Title
of the United States Code, and that such willful false statements may jeopardize
validity of the application, any patent issuing thereon, or any patent to which t
verified statement is directed.

NAME OF INVENTOR	NAME OF INVENTOR	NAME OF INVENTOR
ZINI Sergio Luca	RUGGERI Ruggero	
Signature of Inventor	Signature of Inventor	Signature of Inventor
Sergio Luca Zini		
Date	Date	Date
December 6, 1999	December 6, 1999	

TITLE OF THE INVENTION:

DEVICE FOR USE IN AN AUDIO SIGNAL PROCESSING SYSTEM

The present invention relates to a device for use in an audio signal processing system.

BACKGROUND OF THE INVENTION

All audio system operating members are subject to undesired vibration, which is extraneous to, and tends to distort and impair the final quality of, the original musical message. Such vibration is caused by stress generated in the audio system operating members, any one of which is substantially an energy source of some sort (electrical or mechanical) which releases vibration in the form of synchronous and asynchronous, undulating and pulsating mechanical stress, which tends to remain active for a certain length of time, and hence out of sync with the original audio signal, before diminishing naturally and in uncontrolled (random) manner. Persistent spurious vibration diminishing in uncontrolled manner in its own time is normally referred to as "stationary vibration."

The above audio system operating members are normally divided into mechanical, electronic, acoustic transducing and transmission members.

In other words, the aforementioned stress is generated by vibrating or oscillating components capable of releasing oscillating energy in the form of mechanical stress or vibration not only in the audio band but also at subsonic and ultrasonic frequencies, and is generated by electronic printed circuit components, cables and wiring capable of producing undulating-pulsating magnetic and electrical fields when supplied with the audio (or power) signal and so releasing oscillating energy in the form of sonic-frequency, i.e. audible, microvibrations.

Steps currently taken to compress undesired vibration in audio equipment still fail to provide for optimum sound quality. This is due to the fact that, though compressible, and no matter how accurately it is compressed, such vibration and its effect on the musical message cannot be eliminated entirely.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide a device for use in an audio signal processing system, designed to eliminate the aforementioned drawbacks, and which, at the same time, is straightforward and cheap to implement.

According to the present invention, there is provided a device for use in an audio signal processing system and comprising a vibration transmission circuit for controlled distribution of undesired vibration.

BRIEF DESCRIPTION OF THE DRAWINGS

A number of non-limiting embodiments of the present

invention will be described by way of example with reference to the accompanying drawings, in which:

Figure 1 shows a schematic view in perspective of a preferred embodiment of the device according to the present invention;

Figure 2 shows a larger-scale front view, with parts removed for clarity, of the Figure 1 device;

Figure 3 shows a schematic view in perspective of a different embodiment of the device according to the present invention;

Figure 4 shows front views, with parts removed for clarity, of variations of a detail in Figure 3;

Figure 5 shows a schematic view in perspective, with parts removed for clarity, of a further embodiment of the device according to the present invention;

Figure 6 shows a plan view of the Figure 5 device;

Figure 7 shows a schematic view in perspective of a different embodiment of the Figure 5 device;

Figure 8 shows a schematic view in perspective of a further embodiment of the device according to the present invention;

Figure 9 shows a section of the Figure 8 device;

Figure 10 shows a schematic view in perspective of a different embodiment of the device according to the present invention;

Figure 11 shows a larger-scale section of the Figure 10 device.

DETAILED DESCRIPTION OF THE INVENTION

Number 1 in Figure 1 indicates an audio signal processing device, in particular an optical disk (or so-called "CD") reader, which comprises an outer casing 2 having a horizontal top wall 3, two vertical lateral walls 4 (only one shown in Figure 1), a horizontal bottom wall 5 (not shown in Figure 1) with supporting feet 6, a vertical rear wall 7 (not shown in Figure 1), and a vertical front wall 8 fitted with controls and indicators 9, and in which is formed a drawer 10 for housing a respective optical disk (not shown).

As shown in Figure 2, which shows a front view of device 1 with front wall 8 removed, device 1 comprises a series of operating members 11, each for processing an audio signal, and in particular two electronic circuits 12, and an optical disk reading mechanism 13 comprising drawer 10. In an alternative embodiment not shown, optical disk reading mechanism 13 is replaced by a vinyl disk reading mechanism, by a magnetic disk reading mechanism, or by an analog or digital magnetic tape reading mechanism.

Device 1 also comprises a vibration transmission circuit 14 connected to operating members 11, and which provides for controlled distribution of undesired vibration in operating members 11. In a preferred embodiment, transmission circuit 14 comprises tuned harmonic materials normally used for making stringed musical instruments and defined by essences of wood, such as cypress, fir, lime or yew, or by synthetic vibrating

fibers, such as kevlar or carbon fibers.

Harmonic materials, and in particular wood essences, can be divided into two types: harmonic essences, which are more transmissive and comprise, for example, cypress, fir, maple, yew, lime, poplar and beech; and hard essences, which comprise, for example, ebony, rosewood, cherry, boxwood, pear, olive and apple.

Transmission circuit 14 provides for controlled distribution and for discharge of undesired vibration, which can be compressed but not eliminated. Unlike conventional audio equipment, in which undesired vibration is compressed, transmission circuit 14 provides for channeling and discharging undesired vibration in regions where it cannot interfere with the audio signal.

Transmission circuit 14 comprises a vibration relief member 15 connected to, and for receiving undesired vibration from, operating members 11. Relief member 15 comprises a tuned soundbox 16 having a horizontal board 17 made of harmonic essence (preferably cypress or fir) and supporting operating members 11; and a C-shaped container 18 made of harmonic essence, preferably the same as board 17, and housing board 17 in floating manner so that board 17 is free to oscillate, with respect to container 18, about a central position in three perpendicular directions. In actual use, floating board 17 may be likened to the sounding board of a stringed musical instrument, and C-shaped container 18 to the soundbox.

The essence/s from which soundbox 16 is made is/are selected on the basis of known principles adopted in the making of stringed instruments, so that the parts of soundbox 16 are so tuned as to transmit vibration coherently and, hence, harmonically with no resonance (i.e. unnatural swelling of the musical message).

Board 17 and container 18 are connected by means of a series of known supports 19. In a preferred embodiment, a larger-scale view in perspective of which is shown in Figure 2, each support 19 comprises an L-shaped bracket 20 fitted rigidly to an inner wall of container 18 and supporting, via the interposition of a ring 21 of highly yielding elastic material, a pin 22 connected rigidly to board 17.

Container 18 comprises a horizontal base board 23 defining horizontal bottom wall 5 of casing 2; and two vertical lateral walls 24 extending from opposite ends of, and defining a C shape with, base board 23. Boards 23 and 17 are parallel and respectively comprise a top surface 25 and a bottom surface 26 parallel to and facing each other. Lateral walls 24 are fitted with two surface treated wooden panels 27 defining lateral walls 4 of container 2.

Board 17 is connected acoustically to container 18 via the interposition, between board 17 and container 18, of at least one tuned transmission member 28, which transmits a particular range of frequencies and is positioned contacting bottom surface 26 of board 17 on

one side, and top surface 25 of base board 23 on the opposite side. More specifically, the Figure 2 embodiment has two transmission members 28, a first of which is defined by an acoustic tuning core 29 made of high-vibration-transmitting essence, in particular acoustic fir, and for transmitting relatively high frequencies (ultrasonic frequencies in the top part of the audio spectrum).

Acoustic core 29 is elongated in shape with a varying irregular section extending between a horizontal top base 30 contacting bottom surface 26 of board 17, and a horizontal bottom base 31 contacting top surface 25 of base board 23. The section of core 29 is generally 1-2 sq.cm, generally decreases upwards, and varies in size and shape, which are established as customary in the making of stringed instruments, according to the total weight to be supported by, and the transmission characteristics requested of, core 29.

In an alternative embodiment not shown, two or more cores 29 are used instead of a single relatively large core 29. Which solution is preferable in the case of a heavy board 17 (typically when optical disk reading mechanism 13 is replaced by a vinyl disk reading mechanism).

A second transmission member 28 transmits relatively low frequencies (subsonic frequencies in the bottom part of the audio spectrum) and comprises at least one intermediate body 32 made of hard essence and connected

to bottom surface 26 of board 17 by first elastic members 33, and to top surface 25 of base board 23 by second elastic members 34.

In the Figure 2 embodiment, second transmission member 28 comprises two intermediate bodies 32 located on opposite sides of container 18, and each normally resting against a respective lateral wall 24 and capable of oscillating in a horizontal direction parallel to board 23.

First elastic members 33 comprise four silicone rubber feet 35, each of which is connected to the bottom surface 26 of board 17, and rests on a top surface 36 of respective intermediate body 32; and second elastic members 34 comprise four rubber feet 37, each of which is connected to a bottom surface 38 of respective intermediate body 32, and rests on top surface 25 of board 23.

In an alternative embodiment not shown, a single intermediate body 32 is used, which is substantially the same size as board 23, has a respective hole for noncontacting passage of each core 29, and rests against lateral walls 24.

Container 18 also comprises a top panel 39 made of rigid material, and which is located over, and connected to, lateral walls 24, is parallel to base board 23, and defines top wall 3 of casing 2. Panel 39 also defines a top cover for a parallelepiped-shaped inner seat 40 of container 18 housing board 17 and corresponding operating

members 11. Top panel 39 also closes the acoustic-harmonic circuit defining the path of the mechanical stress inside soundbox 16, and is preferably made of harmonic metal, typically copper.

To minimize the contact surface between panel 39 and lateral walls 24, panel 39 is fitted to lateral walls 24 by means of spacers 41 in which slide screws 42 (the heads of which are shown in Figure 1). In alternative embodiments, spacers 41 may be made of plastic, metal or harmonic wood (preferably harmonic essence).

The load of the acoustic circuit of soundbox 16 is completed by a vertical rear panel 43 defining rear wall 7 of casing 2, and by a vertical front panel 44 defining front wall 8 of casing 2. Panels 43 and 44 are screwed to lateral walls 24 by respective series of screws 45, and are preferably, but not necessarily, made of harmonic metal, typically copper. In an alternative embodiment, panels 43 and 44 are made of aluminium, possibly butter finished on the outside for aesthetic reasons. In yet a further embodiment, panel 43 is made of aluminium, and panel 44 of copper.

As shown in Figure 2, reading mechanism 13 comprises a frame 46 fitted directly to board 17 by respective screws (not shown); and each of electronic circuits 12 comprises a respective frame (or board) 47 also fitted directly to board 17 by respective screws (not shown). In a preferred embodiment, at least one core 48 of acoustic, high-vibration-transmitting essence, typically acoustic

fir, is pressed on between board 17 and each frame 47 to facilitate transmission of vibration from respective electronic circuit 12 to board 17. Each core 48 has a top surface 49 contacting a bottom surface 50 of respective frame 47 with a predetermined pressure; and a bottom surface 51 contacting a top surface 52 of board 17 with said predetermined pressure.

Soundbox 16 is calibrated by adjusting the contact pressure between panels 39, 43, 44 and lateral walls 24 by means of screws 42 and 45.

In actual use, as opposed to being compressed (by means of damping devices), any undesired vibration generated or induced in operating members 11 is transmitted by circuit 14, which defines preferential paths (i.e. vibration channeling circuits) along which to transmit vibration to soundbox 16, where mechanical stationary stress and vibration is discharged, and all the dynamic energy sustaining them is dispersed in controlled manner. In other words, soundbox 16 acts as a vibration "trap" inside which spurious vibration energy is directed and dispersed to discharge any harmful mechanical stress gradually (and therefore in controlled manner) well away from the paths of the electroacoustic signal (or optical-electroacoustic signal in the case of a CD) before it can release any stationary energy capable of interfering with the audio signal being read.

For truly effective transmission-distribution inside the trap, to eliminate any noise induced by spurious

vibration, the preferential vibration paths differ as to type, frequency and speed. For which reason, circuit 14 comprises a system tuned to the characteristic capacities of various materials to effectively and homogeneously transmit and distribute propagation of mechanical-acoustic spurious vibration stress.

Number 53 in Figure 3 indicates an audio signal processing device, in particular an amplifier, which comprises a parallelepiped-shaped casing 54 having a metal horizontal top panel 55, two vertical lateral panels 56, and a horizontal bottom panel 57.

Casing 54 houses an operating member 58, in particular an electronic circuit 59 having a frame (or board) 60. Device 53 also comprises a vibration transmission circuit 61 connected to electronic circuit 59 to distribute any undesired vibration in electronic circuit 59 in controlled manner. Transmission circuit 61 comprises a vertical panel 62 made of harmonic material, in particular harmonic essence (preferably acoustic fir), and having a top surface 63 contacting metal panel 55; and a panel 64 made of harmonic material, in particular harmonic essence (preferably acoustic fir), and having a lateral surface 65 contacting panel 62, and a horizontal surface 66 contacting frame 60 of electronic circuit 59. More specifically, panel 64 is located beneath and supports frame 60.

In actual use, any undesired vibration in electronic circuit 59 is transmitted by panels 64 and 62 to metal

top panel 55, which acts as a vibration relief means.

In the Figure 4a embodiment, frame 60 is connected to, and kept separate from, panel 64 by means of screws 67; and cores 68 of harmonic essence may be pressed between frame 60 and panel 64 to facilitate vibration transmission.

In the Figure 4b embodiment, panel 64 is positioned vertically and pressed between panel 62 and frame 60.

In the Figure 4c embodiment, one panel 56 of casing 54 is made of harmonic material, in particular wood, and itself transmits vibration to metal panel 55 in place of panel 62; and panel 64 is connected to, and kept separate from, bottom panel 57 of casing 54 by means of a series of screws 69.

Number 70 in Figures 5 and 6 indicates an audio signal processing device, in particular a loudspeaker, comprising a parallelepiped-shaped casing 71 (shown without the top panel in Figure 5 for the sake of clarity) housing a pair of operating members 72, in particular a pair of acoustic transducers 73, each of which provides for converting an electric signal into a corresponding acoustic signal. In alternative embodiments not shown, acoustic transducers 73 are other than two in number (generally from one to five).

Device 70 also comprises a vibration transmission circuit 74 connected to acoustic transducers 73 to distribute any undesired vibration in acoustic transducers 73 in controlled manner. Transmission circuit

74 comprises a vertical panel 75 made of harmonic material, in particular harmonic essence (preferably acoustic fir), and supporting acoustic transducers 73; and a C-shaped member 76 housing panel 75 and made of harmonic material, in particular a hard or semihard essence. Member 76 and panel 75 together define a parallelepiped-shaped structure and the vertical lateral walls of casing 71.

Device 70 also comprises at least one shaped body 77 housed inside casing 71, between panel 75 and member 76, to define a labyrinth, and which, in a preferred embodiment, is made of harmonic material, in particular a hard essence. Shaped body 77 is connected acoustically to panel 75 and/or to member 76 via the interposition of at least one core 78 of harmonic essence.

In actual use, any undesired vibration in acoustic transducers 73 is transmitted by transmission circuit 74 to the outside air surrounding casing 71, which air acts in other words as a vibration relief means.

In an alternative embodiment shown in Figure 7, casing 71 is a known type, and transmission circuit 74 comprises a single panel 79 made of harmonic material, in particular harmonic essence (preferably acoustic fir), and connected to casing 71. Panel 79 and casing 71 are preferably connected maintaining panel 79 in contact with an outer surface of casing 71. In alternative embodiments not shown, transmission circuit 74 comprises a number of panels 79 connected to casing 71. Compared with the

Figure 5 and 6 embodiment, the Figure 7 embodiment provides for relatively modest vibration transmission, but, on the other hand, can also be used with known commercial loudspeakers with no substantial alterations required.

Any electronic circuits (not shown) in loudspeaker 70 - typically, crossover circuits - are preferably fitted to panel 75, possibly with the interposition of cores of transmissive essence (in exactly the same way as in Figures 2, 3 and 4).

Number 80 in Figures 10 and 11 indicates an audio signal processing device, in particular a cable for transmitting an audio signal in the form of electric pulses by means of an operating member 81, in particular a pair of insulated conductors 82 and 83. Conductor 82 is housed inside a sheath 84 of insulating material, which defines a transmission path P and has an inside dimension D1 greater than an outside dimension D2 of conductor 82; and conductor 83 is coiled about sheath 84. Cable 80 also comprises two connectors 85 (only one shown in Figure 10) at the two opposite ends of cable 80; conductors 82, 83 and sheath 84 are connected mechanically to each connector 85; and each portion of conductor 82 is obviously free to move inside sheath 84 in a direction perpendicular to path P.

Sheath 84 defines a vibration transmission circuit 86 by permitting conductor 82 to vibrate and so transmit any undesired internal vibration to the air inside sheath

84.

In a preferred embodiment, conductor 82 is connected to a positive of the electric signal, and conductor 83 to a negative (or ground) of the electric signal.

In a further embodiment not shown, cable 80 comprises a further conductor coiled about a further sheath of insulating material housing conductors 82 and 83.

In a further embodiment not shown, a cable identical with the one in Figures 10 and 11 may be used for supplying electrical power to an audio apparatus, e.g. of the type shown in Figures 1 and 3. In which case, connectors 85 are replaced by equivalent connectors insertable inside electric power sockets, and the outer insulation of conductors 82 and 83 is changed. Inner conductor 82 is preferably connected to a positive (or phase), and outer conductor 83 to a negative (or neutral, or ground).

Number 87 in Figures 8 and 9 indicates an audio apparatus supply device, in particular a multiple outlet having a supply cable 88 and a number of outlets 89. Multiple outlet 87 comprises a casing 90 housing outlets 89; and a vibration transmission circuit 91, in turn comprising a panel 92, which is made of harmonic material, in particular harmonic essence, supports outlets 89, and is connected to a metal panel 93 acting as a vibration relief member. Panels 92 and 93 preferably define outer walls of casing 90.

CLAIMS

1) A device (1; 53; 70; 80; 87) for use in an audio signal processing system and comprising at least one operating member (11; 58; 72; 81) for processing an audio signal; and a vibration transmission circuit (14; 61; 74; 86; 91), which in turn comprises harmonic materials acoustically tuned to one another, and is connected to said operating member (11; 58; 72; 81) to distribute undesired vibration in controlled manner.

2) A device as claimed in Claim 1, wherein said transmission circuit (14; 61; 74; 86; 91) comprises at least one chain of harmonic materials connected acoustically to one another to transmit said vibration.

3) A device as claimed in Claim 1, wherein said transmission circuit (14; 61; 74; 86) comprises vibration relief means (15; 55; 76) connected to said operating member (11; 58; 72; 81) to receive said undesired vibration from the operating member (11; 58; 72; 81).

4) A device (1) as claimed in Claim 3, wherein said relief means (15; 55; 76) comprise a tuned soundbox (16).

5) A device as claimed in Claim 4, wherein said soundbox (16) comprises a supporting board (17) made of harmonic material and supporting the operating member (11; 58; 72; 81); and a container (18) housing said supporting board (17) in floating manner.

6) A device as claimed in Claim 5, wherein said supporting board (17) is mounted in floating manner so as

to be free to oscillate, about a central position of its own, in three perpendicular directions and with respect to said container (18).

7) A device as claimed in Claim 5, wherein said supporting board (17) is connected acoustically to said container (18) via the interposition, between the supporting board (17) and the container (18), of at least one tuned transmission member (28) for transmitting a particular range of frequencies.

8) A device as claimed in Claim 5, wherein said container (18) comprises at least one horizontal base board (23), and two vertical lateral walls (24) extending from opposite ends of the base board (23); the base board (23) and the lateral walls (24) together defining a C shape; and said supporting board (17) being a horizontal board parallel to the base board (23) and located between said lateral walls, and having a bottom surface (26) facing a top surface (25) of said base board (23).

9) A device as claimed in Claim 8, wherein said supporting board (17) is connected acoustically to said container (18) via the interposition, between the supporting board (17) and the container (18), of two tuned transmission members (28), each of which transmits a particular range of frequencies and is positioned contacting said bottom surface (26) of said supporting board (17) on one side, and contacting said top surface (25) of said base board (23) on the opposite side.

10) A device as claimed in Claim 9, wherein a first

of said two transmission members (28) comprises at least one acoustic tuning core (29) made of a highly vibration-transmitting essence.

11) A device as claimed in Claim 8, wherein a second of said two transmission members (28) comprises at least one intermediate body (32) made of a hard essence; said intermediate body (32) being connected to the bottom surface (26) of said supporting board (17) by means of first elastic members (33), and being connected to the top surface (25) of said base board (23) by means of second elastic members (34).

12) A device as claimed in Claim 11, wherein said intermediate body (32) normally rests on said lateral walls (24), and is capable of oscillating in a horizontal direction parallel to said supporting board (17).

13) A device as claimed in Claim 11, wherein said second transmission member (28) comprises a pair of intermediate bodies (32) on opposite sides of said container (18).

14) A device as claimed in Claim 11, wherein said first elastic members (33) comprise four silicone rubber feet (35); and said second elastic members (34) comprise four rubber feet (37).

15) A device as claimed in Claim 14, wherein said intermediate body (32) has a top surface (36) facing the bottom surface (26) of said supporting board (17), and a bottom surface (38) facing the top surface (25) of said base board (23); said first elastic members (33) being

connected to the bottom surface (26) of said supporting board (17), and resting on the top surface (36) of said intermediate body; and said second elastic members (34) being connected to the bottom surface (38) of said intermediate body, and resting on the top surface (25) of said base board (23).

16) A device as claimed in Claim 14, wherein said container (18) comprises a top panel (39) made of rigid material, located over and connected to said lateral walls, and parallel to said base board (23); said top panel (39) defining a top cover of a parallelepiped-shaped inner seat (40) of said container (18); and said supporting board (17) being housed inside said seat (40).

17) A device as claimed in Claim 16, wherein said top panel (39) is made of a harmonic metal.

18) A device as claimed in Claim 16, wherein said container (18) comprises a front panel (44) and a rear panel (43), which are made of metal material and are positioned vertically and perpendicular to said lateral walls (24) to close said seat (40).

19) A device as claimed in Claim 5, wherein said operating member (11; 58; 72; 81) is defined by an audio source reading mechanism (13); said mechanism (13) having a frame (46) fitted directly to said supporting board (17).

20) A device as claimed in Claim 5, wherein said operating member (11; 58; 72; 81) is defined by an electronic circuit (12); said electronic circuit (12)

having a frame (47) fitted directly to said supporting board (17); and at least one core (48) of highly vibration-transmitting acoustic essence being interposed between said frame (47) and said supporting board (17).

21) A device as claimed in Claim 5, comprising at least two said operating members (11), each of which has a respective frame (46, 47) fitted directly to said supporting board (17); a first of said two operating members (11) being defined by an audio source reading mechanism (13); a second of said two operating members (11) being defined by an electronic circuit (12); and at least one core (48) of highly vibration-transmitting acoustic essence being interposed between the frame (47) of said second operating member (11) and said supporting board (17).

22) A device (53) as claimed in Claim 1, and comprising a casing (54) having a horizontal top panel (55); said operating member (58) being defined by an electronic circuit (59) having a frame (60); and said transmission circuit (61) comprising a vertical first member (62) made of harmonic material and having a top surface (63) contacting said top panel (55); and a second member (64) made of harmonic material and having a first surface (65) contacting said first member (62), and a second surface (66) contacting said frame (60).

23) A device as claimed in Claim 22, wherein said horizontal top panel (55) is metallic and defines said vibration relief means (55).

24) A device (70) as claimed in Claim 1, wherein said operating member (72) is defined by an acoustic transducer (73) for converting an electric signal into a corresponding acoustic signal; said transmission circuit (74) comprising a panel (75) made of harmonic material and supporting said operating member (72); and a C-shaped member (76) housing said supporting panel (75).

25) A device as claimed in Claim 24, wherein said supporting panel (75) and said C-shaped member (76) together define a parallelepiped-shaped structure wherein said supporting panel (75) is positioned vertically.

26) A device as claimed in Claim 24, wherein said supporting panel (75) is made of a highly transmissive harmonic essence, in particular acoustic fir, and said C-shaped member (76) is made of a hard or semihard essence.

27) A device as claimed in Claim 26, and comprising at least one shaped body (77) located between said supporting panel (75) and said C-shaped member (76) to define a labyrinth.

28) A device as claimed in Claim 27, wherein said shaped body (77) is made of a hard essence.

29) A device as claimed in Claim 27, wherein said shaped body (77) is connected acoustically to said supporting panel (75) and/or to said C-shaped member (76) via the interposition of at least one core (78) of harmonic essence.

30) A device (70) as claimed in Claim 1, wherein said operating member (72) is defined by an acoustic

transducer (73) for converting an electric signal into a corresponding acoustic signal; the device (70) comprising a supporting structure (71) containing said acoustic transducer (73) and defined by a number of outer surfaces; and said transmission circuit (74) comprising a panel (79) made of harmonic material and connected to at least one outer surface of said supporting structure (71).

31) A device (80) for use in an audio signal processing system; the device (80) comprising at least one operating member (81) for processing an audio signal; and a vibration transmission circuit (86) connected to said operating member (81) to distribute undesired vibration in controlled manner; said operating member (81) being defined by at least one pair of insulated conductors (82, 83) for transmitting an audio signal in the form of electric pulses; a first conductor (82) being housed in a sheath (84) of insulating material defining a transmission path (P), and a second conductor (83) being coiled about said sheath (84); an inside dimension (D1) of said sheath (84) being greater than an outside dimension (D2) of said first conductor (82) to enable the first conductor (82) to oscillate inside the sheath (84); and the sheath (84) defining said vibration transmission circuit (86).

32) A device as claimed in Claim 31, wherein said operating member (81) comprises a third conductor coiled about a further sheath of insulating material housing

said first and second conductor (82, 83).

33) A device for use in an audio signal processing system; the device comprising at least one operating member; and a vibration transmission circuit connected to said operating member to distribute undesired vibration in controlled manner; said operating member being defined by at least a pair of insulated conductors for transmitting electrical power for supplying an audio apparatus; a first conductor being housed inside a sheath of insulating material defining a transmission path, and a second conductor being coiled about said sheath; and an inside dimension of said sheath being greater than an outside dimension of said first conductor to enable the first conductor to oscillate inside the sheath.

34) A device as claimed in Claim 33, wherein said operating member comprises a third conductor coiled about a further sheath of insulating material housing said first and second conductor.

35) A device (87) for use in an audio signal processing system; the device (87) comprising at least one operating member (89); and a vibration transmission circuit comprising harmonic materials and connected to said operating member (89) to distribute undesired vibration in controlled manner; said operating member being defined by an electric outlet (89) for supplying an audio apparatus.

ABSTRACT

A device for use in an audio signal processing system, the device having at least one operating member for processing an audio signal; and a vibration transmission circuit connected to the operating member to distribute undesired vibration in controlled manner. (Figure 2)

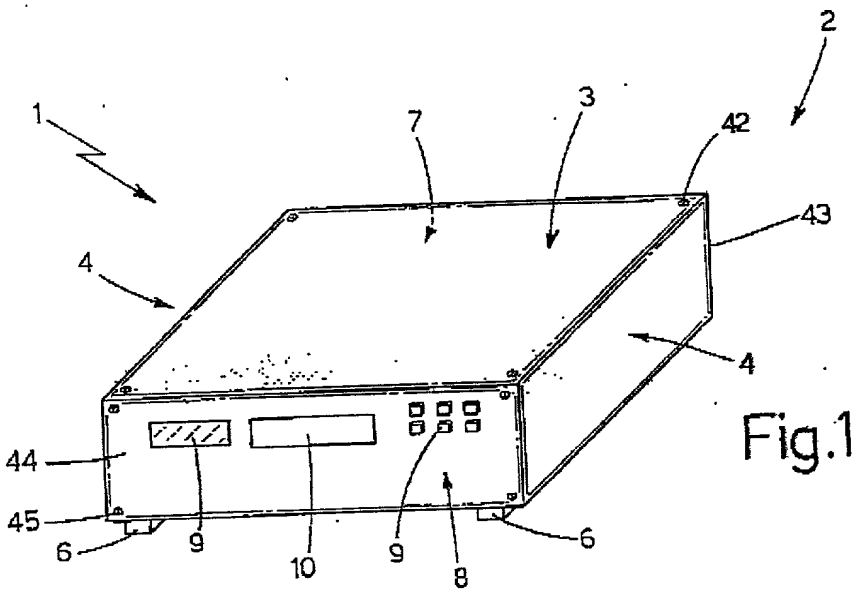
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Fig.1

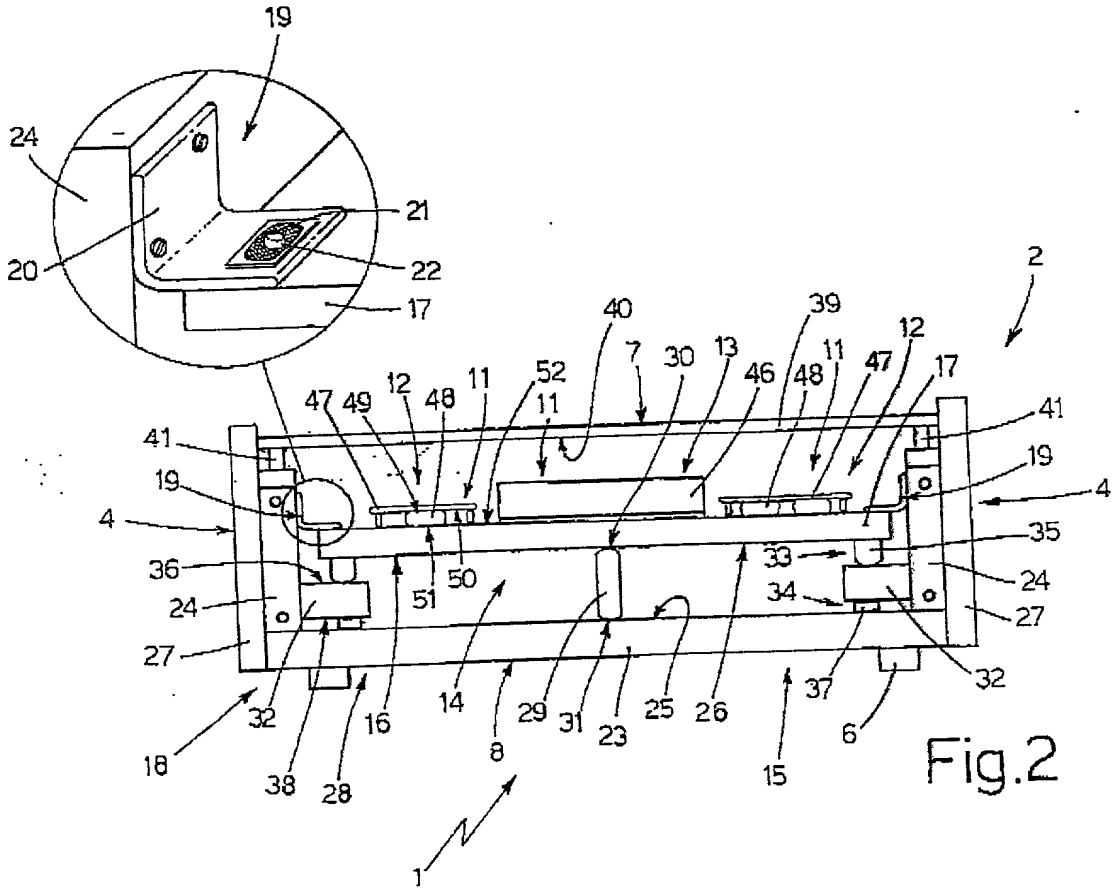
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Fig.2

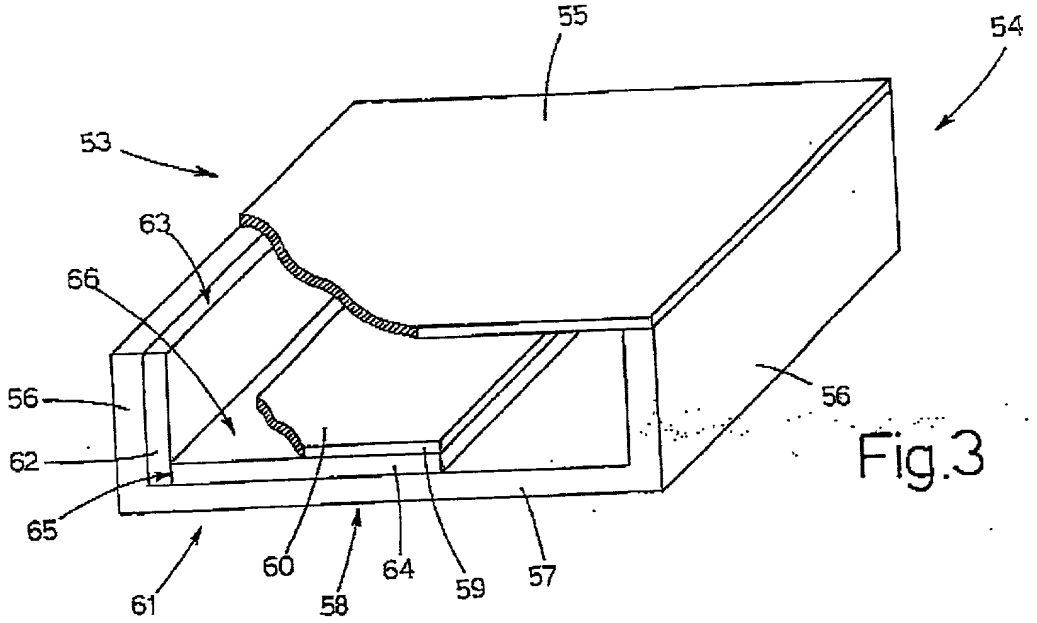
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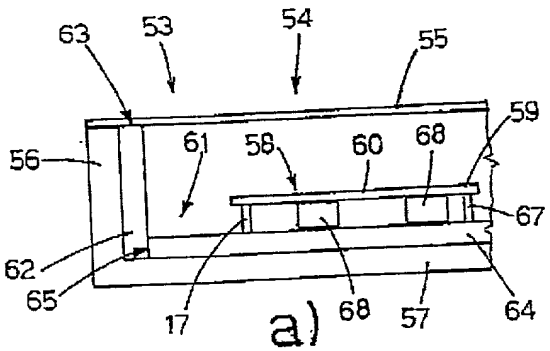
Fig.3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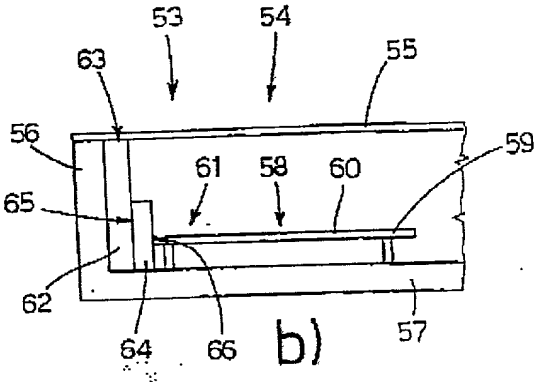
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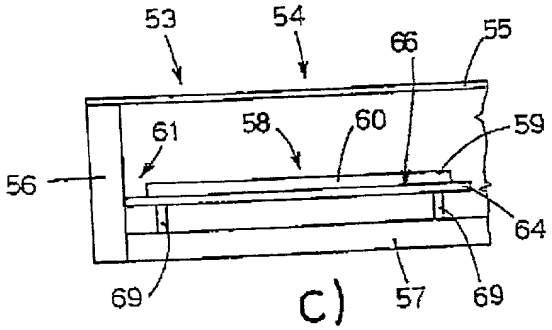
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Fig.4

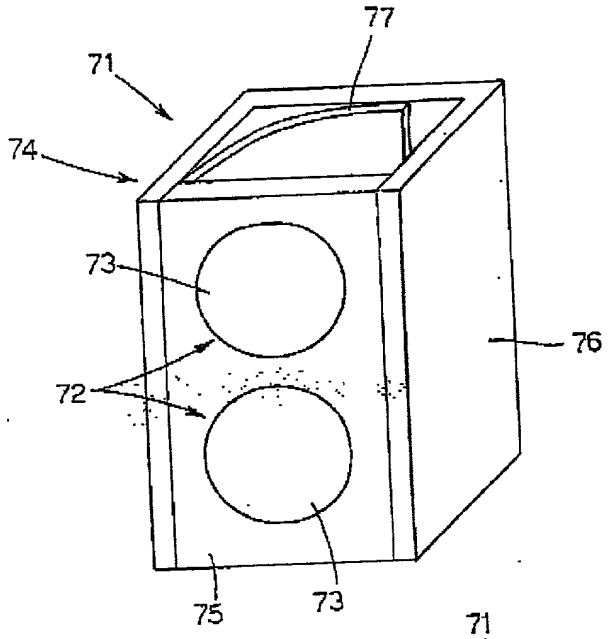


Fig.5

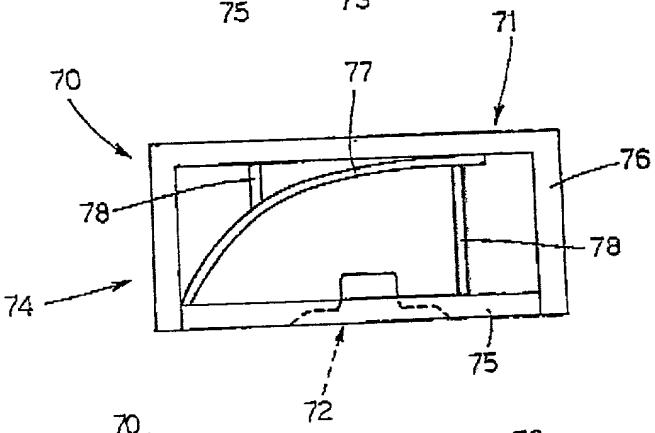


Fig.6

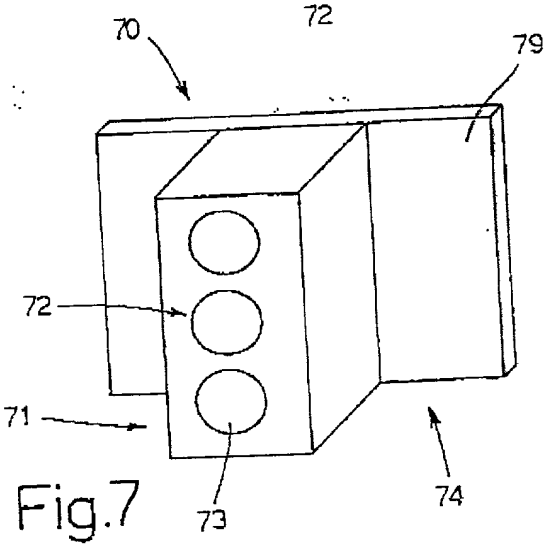


Fig.7

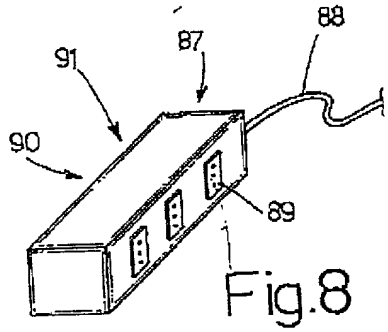
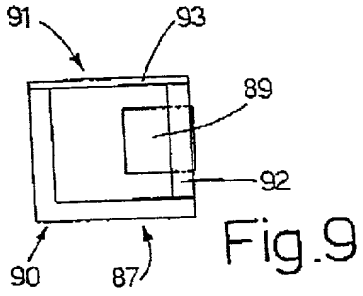


Fig.8



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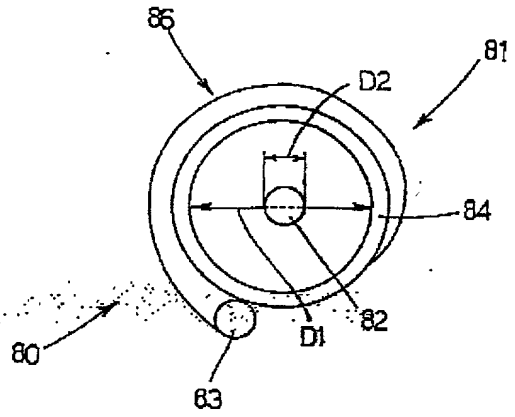

Fig.11

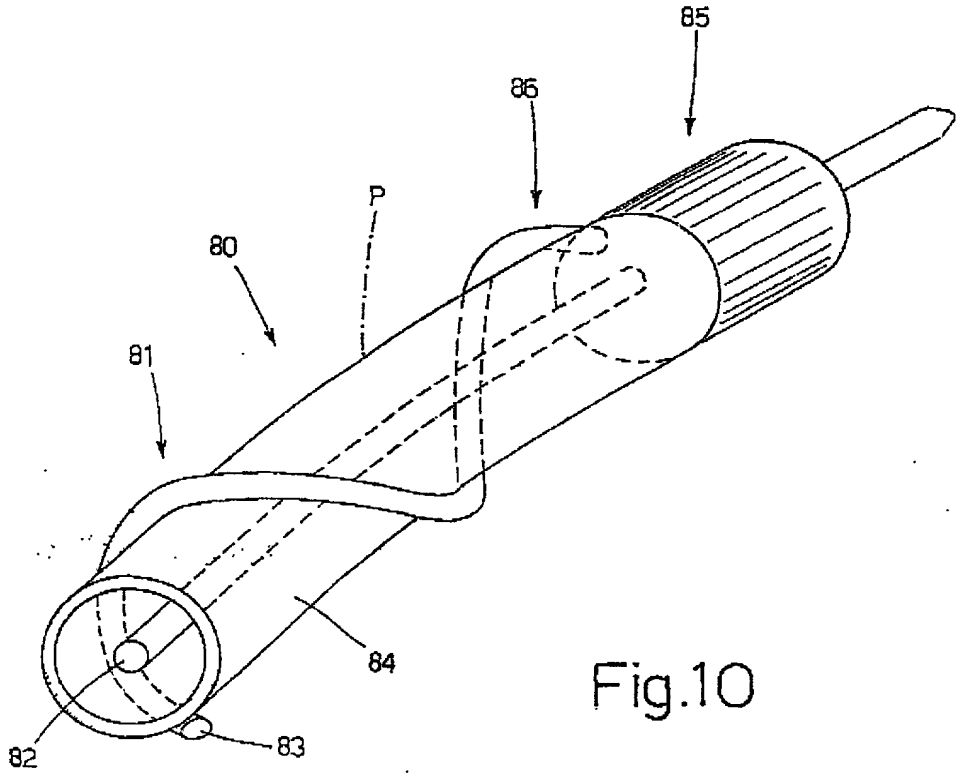

Fig.10

Attorney's Docket No.: 1915-00100

DECLARATION AND POWER OF ATTORNEY - ORIGINAL APPLICATION

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below beneath my name:

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which Letters Patent is sought on the invention entitled

"DEVICE FOR USE IN AN AUDIO SIGNAL PROCESSING SYSTEM"

the specification of which (check one)
- xxx is attached hereto
- _____ was filed on _____ as Application S.N. _____ and was amended on _____

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by an amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, Sec. 1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, Sec. 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or invention certificate having a filing date before that of the application on which priority is claimed.

Prior Foreign Application(s)		Priority Claimed		
TO98A 001069	ITALY	22.12.1998	XXX	
(Number)	(Country)	(Day/Month/Year Filed)	YES	NO
(Number)	(Country)	(Day/Month/Year Filed)	YES	NO

I hereby claim the benefit under Title 35, United States Code, Sec. 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, Sec. 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, Sec. 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application.

(Application Ser. No.)	(Filing Date)	(Status) (patented,pending,abandoned)
(Application Ser. No.)	(Filing Date)	(Status) (patented,pending,abandoned)

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith:

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The undersigned hereby authorizes the U.S. attorney(s) or agent(s) named herein to accept and follow instructions from Studio Torta S.r.l. as to any action to be taken in the Patent and Trademark Office regarding this application without direct communication between the U.S. attorney(s) or agent(s) and the undersigned. In the event of a change in the persons from whom instructions may be taken, the U.S. attorney(s) or agent(s) named herein will be so notified by the undersigned.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that the statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

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Citizenship Italian
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Full name of third joint inventor _____
Inventor's signature _____ Date _____
Residence _____
Citizenship _____
Post Office Address _____